

Appl. No 10/671,757

Amdt. Dated

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5        **Amendments to the Specification:**

Please replace the specification with the following amended specification:

10        **SOCKET ~~RATCHET~~ AND ~~RATCHETING~~ WRENCH OF ROTARY**  
**SHAPE**

**BACKGROUND OF THE INVENTION**

**Field of the Invention**

15        The present invention relates to a socket ratchet and ~~ratcheting~~  
wrench ~~of rotary shape~~, and more particularly to a ~~ratcheting~~ wrench ~~of rotary~~  
shape that is ~~not only applicable to different structured sockets but also~~  
capable of ~~driving~~ rotating polygonal fasteners ~~independently~~.

**Description of the Prior Arts**

20        A ratchet wrench and a socket of prior arts as shown in Fig. 1, which  
generally includes a head portion 11 connected with a wrench body 10, in the  
head portion 11 is defined with a ratchet 12. At the center of the ratchet 12 is  
formed a through engaging hole 13 ~~is formed~~, the engaging hole 13 is defined  
at its inner periphery with positive arc ribs 131. Furthermore, an engaging  
hole 21 with predetermined shape is formed in the socket 20 for engaging

with fasteners to be operated (such as screw, nut), on the outer periphery of the socket 20 is formed with negative arc-formed grooves 22 for engaging with the respective ribs 131 of the ratchet 12. The socket 20 can be driven by the wrench body 10 so as to achieve a screwing and unscrewing operation.

5 However, there are still some disadvantages of this conventional ratchet wrench as follows need to be improved:

First, the respective ribs 131 on the ratchet 12 are positive arc formed, the grooves 22 of the socket 20 must be negative arc-formed so as to engage with the ribs 131, in this case, the ratchet wrench provided with positive  
10 arc-formed ribs 131 can only be matched with the socket 20 defined with negative arc-formed grooves 22, ~~thereby~~ the applicability of the conventional ratchet wrench is limited.

Second, when the ratchet wrench provided with ribs 131 are used to engage directly with a fastener 30, due to the head of the fastener 30 is usually  
15 polygonal-shaped (such as hexagonal or octagonal-shape), and the respective ribs 131 are employed to engage with the ~~[[sides]]~~ respective ~~[[sides]]~~ edges of the fastener 30, and the contact between the ribs 131 are line contacted with the sides of the fastener 30 is line contact, the torque caused during rotation of the ratchet wrench is likely to cause a slippage between the ratchet 12 and the  
20 fastener 30, in this case, it may be allow the possibility of the jaw of the wrench falling open during use. This conventional ratchet wrench is only able to drive the fastener 30 with its engaging hole 13, thus the applicability is limited.

The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional ratchet wrench.

### **SUMMARY OF THE INVENTION**

5 The primary object of the present invention is to provide a socket and ratcheting wrench of rotary shape, wherein the ratchet wrench is applicable to different shaped sockets.

Another object of the present invention is to provide a socket and ratcheting wrench of rotary shape, wherein the ratchet wrench is capable of driving polygonal fasteners.

10 The present invention will become more obvious from the following description when taken in connection with the accompanying drawings, which shows, for purpose of illustrations only, the preferred embodiment in accordance with the present invention.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

15 Fig. 1 is plan view of a conventional socket and ratchet wrench;

Fig. 2 is another plan view of a conventional socket and ratchet wrench;

Fig. 3 is an exploded view of a socket and ratchet and ~~ratcheting~~ wrench ~~of rotary shape~~ of the present invention;

20 Fig. 4 is a perspective assembly view of the socket ratchet and ~~ratcheting~~ wrench ~~of rotary shape~~ of the present invention;

Fig. 5 is a top view of the socket ratchet and ~~ratcheting~~ wrench ~~of rotary shape~~ of the present invention, wherein the ratchet engages with a first

end of the socket;

Fig. 6 is a partial amplified view of Fig. 5;

Fig. 7 is a top view of the socket ratchet ~~and ratcheting~~ wrench of  
~~rotary-shape~~ of the present invention, wherein the ratchet engages with a  
5 second end of the socket;

Fig. 8 is a partial amplified view of Fig. 7.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to Figs. 3-4, a socket ratchet ~~and ratcheting~~ wrench of  
~~rotary-shape~~ of the present invention generally comprises a wrench body 40,  
10 an annular-toothed block 50 and a socket 60.

The wrench body 40 has a head portion 41 and a handle portion 42.  
In the proximity to the center of the head portion 41 is defined with a  
receiving hole 411 and a recess 412. ~~The recess 412 is connected in~~  
communication with the receiving hole 411. On the inner periphery of the  
15 receiving hole 411 is provided ~~[[with]]~~ an elastic C-shaped ring 413 and a ring  
414, ~~[[whereas]]~~ in the recess 412 is received a locking block 415 ~~is received~~.  
~~The handle portion 42 serves for user's gripping.~~

The annular-toothed block 50, via the elastic C-shaped ring 413, the  
ring 414 and the locking block 415, is rotatably received in the receiving hole  
20 411 of the wrench body 40. The annular-toothed block 50 is defined with a  
through engaging hole 51, on the inner periphery of the engaging hole 51 are  
defined six ribs 52 ~~are defined~~, each paired neighboring ribs 52 are connected  
by a negative arc surface 53, at both sides of each rib 52 is respectively

provided with a flat first engaging surface 521, between the first engaging surfaces 521 of the respective ribs 52 is defined a cambered second engaging surface 522 ~~is defined~~. The first engaging surface 521 is connected to the second engaging surface 522 via an arc surface 523.

5           The socket 60 has a first end 61 and a second end 62. ~~The socket 60 attenuates gradually from the first end 61 to the second end 62. Wherein on the outer periphery of the first end 61~~ are defined six grooves 611 ~~are defined~~ for engaging with the respective ribs 52 of the annular-toothed block 50. The second end 62 is provided on its outer periphery with six planes 621 for  
10   engaging with the second engaging surfaces 522 of the respective ribs 52 of the annular-toothed block 50. Furthermore, the socket 60 is defined with a through engaging hole 63 for engaging with fasteners to be operated.

Referring to Figs. 5-6, ~~in which~~, when the wrench body 40 engages  
[[with]] the first end 61 of the socket 60, the first engaging surface 521, the  
15   second surface 522 and the negative arc surface 53 of the respective ribs 52 of the annular-toothed block 50 will engage in the respective grooves 611 of the socket 60, such that the ratchet ~~and ratcheting~~ wrench ~~of rotary shape~~ is able to drive the socket 60 to accomplish an screwing or unscrewing operation ~~on fasteners~~. With reference to Figs. 7-8, wherein the wrench body 40 also can  
20   engage with the second end 62 of the socket 60, the second engaging surfaces 62 of the respective ribs 52 of the annular-toothed block 50 are employed to engage with the respective planes 621 of the socket 60, so that the socket 60 is driven rotated by the ratchet ~~and ratcheting~~ wrench ~~of rotary shape~~. Thus, the

socket 60 can bi-directionally engage with the ratchet ~~and ratcheting~~ wrench  
of ~~rotary shape~~ of the present invention. ~~By this way,~~ the ratchet ~~and~~  
~~ratcheting~~ wrench of ~~rotary shape~~ of the present invention is capable of  
engaging with two different shaped sockets of different structures, so as to  
5 improve thus improving the applicability.

In addition, since the ratchet ~~and ratcheting~~ wrench of ~~rotary shape~~  
can engage with the socket 60 which having a hexagonal cross section, which  
can be used to independently engage with the fasters having a hexagonal cross  
section, so as to accomplish a screwing or unscrewing operation, and thus  
10 further improves the applicability of the ratchet ~~and ratcheting~~ wrench of  
~~rotary shape~~ of the present invention.

While we have shown and described various embodiments in  
accordance with the present invention, it should be clear to those skilled in the  
art that further embodiments may be made without departing from the scope  
15 of the present invention.